**AN APPLICATION OF THE DIEBOLD-YILMAZ VOLATILITY SPILLOVER INDEX USING LÉVY DRIVEN COGARCH MODELS**

Yakup ARI

*Department of Economics,*

*Alanya Alaaddin Keykubat University, Turkey*

[*yakup.ari@alanya.edu.tr*](mailto:yakup.ari@alanya.edu.tr)

[*https://orcid.org/0000-0002-5666-5365*](https://orcid.org/0000-0002-5666-5365)

The motivation of this study is to apply the volatility estimation derived from the Lévy processes within the Diebold-Yılmaz approach, which is widely used in the literature. In the study, stock and cryptocurrency market data were used for illustrative purposes. The reason for this is that the interest in the crypto money market has increased especially in the global markets and Turkey, where uncertainties have increased even more during the Covid-19 period. Turkey ranks fourth in the world and first in Europe among the world's 74 largest economies that mostly use cryptocurrencies compared to the population. In this case, revealing the interaction between crypto money markets and Turkish financial markets has become an important study question. As an example of the application, the study aims to reveal the volatility spillover between cryptocurrencies, and the Borsa Istanbul Bilisim index and also shows the impact of the Covid-19 epidemic.. For this purpose, the period after March 11, 2020, when the first Covid-19 case was seen in Turkey, was considered as the period of Covid-19. This date is also the date that the World Health Organization declared a global epidemic. Thus, two equal data periods were created according to the mentioned date. Accordingly, the volatilities of Bitcoin, Ethereum, and BIST-Bilisim Index were estimated with the COGARCH model derived from the Lévy processes which can be applied instead of discrete models in estimating the volatility of financial time series with irregular time intervals. Then, the stationarities of the obtained volatility data were tested and, the transition between the obtained volatility data is examined according to the Diebold-Yilmaz Financial Connectedness approach. Diebold-Yılmaz spillover index, which describes the volatility spillover on the basis of the Vector Autoregressive model, shows the contribution of the volatility in price indices to the forecasting error variance. The total spillover index is measured based on the Cholesky decomposition. The volatility spillover index is created and compared with the same methods in two periods with an equal number of observations. In conclusion, the total spillover index indicates a low connectedness between the markets in both periods.

Keywords: Bitcoin, Covid-19, Diebold-Yılmaz, COGARCH, , Volatility Spillover